



ATTO Technology, Inc.

iPBridgeTM 1500D/E

iPBridgeTM 1550D/E

Installation and Operation Manual

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Introduction: iSCSI provides storage options

The iSCSI protocol allows storage devices such as hard drives, tape drives and libraries and CD jukeboxes to attach easily to Internet Protocol networks such as Gigabit Ethernet. The iPBridge 1500 and the ATTO iPBridge 1550 support the high throughput needs of streaming data transfers, optimizing performance and management using ATTO Technology intelligent Bridging Architecture™.

The iSCSI protocol increases the capabilities and performance of storage data transmission by transmitting data over local area networks (LANs), wide area networks (WANs), or the Internet, providing location-independent data storage and retrieval to enhance current and future Storage Area Networks (SANs).

Gigabit Ethernet (GbE) is a transmission technology based on the Ethernet format and protocol used in local area networks (LANs). It

provides a data rate of 1 billion bits per second (one gigabit) as defined in the IEEE 802.3 standard.

intelligent Bridging Architecture, the engine within ATTO FibreBridge™ and iPBridge products, uses ATTO Data Routing Fabric topology and ATTO Virtual Device Manager to optimize performance. For more information see www.attotech.com/iBA.html.

Glossary

More information is available through the Storage Networking Industry Association (www.snia.org/education/dictionary), the Network Data Management Task Force (www.ndmp.org), and the IETF (www.ietf.org).

Term	Definition
Btl	Bus-Target-LUN: Identification for a parallel SCSI device
CHAP	Challenge-Handshake Authentication Protocol: If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets (passwords). An initiator may reject this negotiation.
DP data port	GbE port used for data movement and management
firmware	Software stored in read-only memory (ROM) or programmable ROM (PROM); firmware is often responsible for the behavior of a system when it is first switched on
GbE Gigabit Ethernet	A protocol for transferring block-level IO over Telnet networks; speed at which data is passed over Ethernet
IETF	Internet Engineering Task Force: The standards body responsible for Internet standards such as SNMP and Telnet through a community of network designers, operators, vendors and researchers concerned with the evolution and smooth operation of the Internet
initiator device	A component which originates a command
iSCSI	Internet SCSI (Small Computer System Interface), a protocol to link data storage facilities over the Internet or an intranet developed by the Internet Engineering Task Force (IETF); carries SCSI commands over IP networks to facilitate data transfers over intranets and manage storage over long distances
LED	Light-emitting diode, a type of diode that emits light when current passes through it; visible LEDs are used as indicator lights on all sorts of electronic devices

Term	Definition
LUN	Logical Unit Number: a SCSI identifier of a device
NAS	Network Attached Storage: storage elements connected to a network to provide file access services to computer systems; an NAS Storage Element includes an engine to implement the file services and one or more devices to store data; NAS elements may be attached to any type of network; an NAS host system uses a file system device driver to access data and NAS systems interpret these commands to execute the necessary internal file and device I/O operations
SCSI	Small Computer Systems Interface: a processor-independent standard for system-level interface between a computer and intelligent devices including hard disks, floppy disks, CD-ROM, printers, scanners, etc.
SNMP	Simple Network Management Protocol: a standard for monitoring and managing systems and devices in a network; data is defined by a MIB; functions supported include the request and retrieval of data
Tape Window	A fixed-size parameter indicating the maximum data length that can be written to a tape in one Data Mover action; once the tape window is reached, the Data Mover will pause until writes occur and the tape window becomes available.
TCP/IP	Abbreviation for the basic communication protocols used on the Internet including Transmission Control Protocol (TCP), Internet Protocol (IP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP) and Telnet.

1 Setting up the iPBridge

The ATTO bridge family of products provides GbE-to-SCSI or Fibre Channel-to-SCSI bridges available as embeddable boards, stand alone enclosures that can be fitted for rackmount integration, or desktop units, depending on the model and your needs.

The ATTO iPBridge and ATTO FibreBridge family of products share common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated into products throughout the family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (Storage Area Network) or NAS (Network Attached Storage).

The ATTO iPBridge 1500E/D is a low cost single-channel iSCSI-to-SCSI bridge that enables existing Direct-Attached Storage solutions to be integrated into an Ethernet network allowing IT departments to leverage existing investment in SCSI storage and Ethernet infrastructure and expertise.

The ATTO iPBridge 1550E/D is a cost-effective way of expanding your existing storage capacity without sacrificing performance. The ATTO iPBridge 1550E/D is ideally suited to the SME or for corporate IT departments seeking to expand storage requirements with minimal disruption while making existing SCSI equipment accessible over an Ethernet network to all network users.

To make sure you have the most up-to-date version of the firmware, visit the ATTO Technology website, www.attotech.com.

iPBridge1500 features

- One independent Gigabit Ethernet port and one independent Ultra3 SCSI port
- Support for iSCSI protocol V1.0
- ATTO ExpressNAVTM, integrated web server for configuration, upgrades, monitoring and management

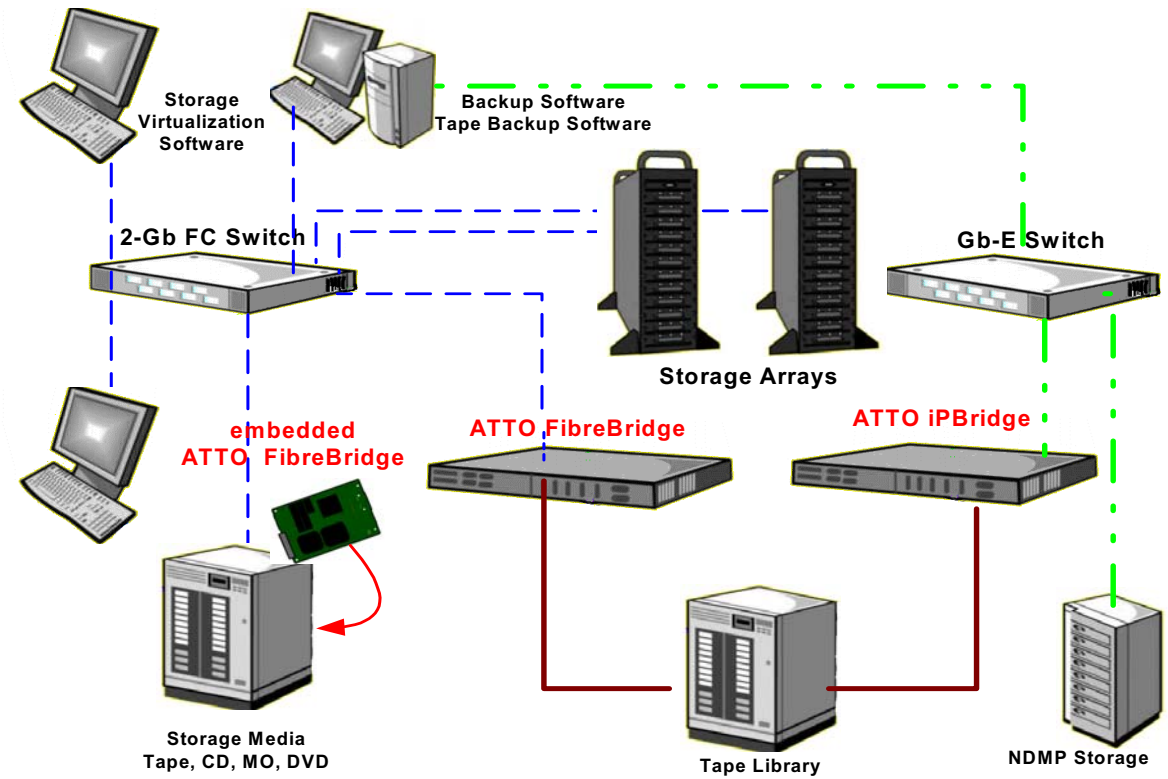
- Available as a desktop or embedded form factor
- 10/100 Ethernet management port for LAN-based monitoring and management
- Command Line Interface (CLI) for configuration and management
- RS-232 serial port with RJ11 connector
- Diagnostic capabilities
- Support for manual and auto LUN mapping
- Intelligent Bridging ArchitectureTM for optimized performance
- Up to 37MB/sec. throughput

iPBridge 1550 features

- One independent Gigabit Ethernet port and one independent Ultra3 SCSI port
- Support for iSCSI protocol V1.0
- ATTO ExpressNAVTM, integrated web server for configuration, upgrades, monitoring and management
- Available as a desktop or embedded form factor
- 10/100 Ethernet management port for LAN-based monitoring and management
- Command Line Interface (CLI) for configuration and management
- RS-232 serial port with RJ11 connector
- Diagnostic capabilities
- Support for manual and auto LUN mapping
- Intelligent Bridging ArchitectureTM for optimized performance
- Near wire speed sustained throughput
- Virtual Device Architecture for features such as hardware RAID and Virtual Tape
- Ideal solution for connecting high performance tape and disk devices to an IP Storage Area Network (SAN)
- Up to 100 MB/sec. throughput

Possible SAN/NAS configuration

Ethernet
Fibre Channel
SCSI



1.1 ATTO iPBridge 1500E

The ATTO iPBridge 1500E is a 1-Gigabit Ethernet to SCSI embeddable bridge for midrange performance, cost effective solutions in SMB/SME environments.

The iPBridge 1500E includes a single Ethernet port which may be used for either data transfer or configuration, a serial management port and a SCSI port.

Dimensions

Length: 6.4 inches

Width: 4.4 inches

Height of the tallest component: .536 inches

Environment

Operating Temperature: 5-40° C external

Ambient air should not exceed 40°C.

Humidity: 10-90% non-condensing

Recommended airflow: 11 cubic feet per minute

Power

The iP1500E board may be powered from a 4-pin connector.

Input voltage: 12V DC $\pm 10\%$ derived from a 4-pin connection.

Power draw: 12V, 1.7 amps

4- pin power connector pin outs

Pin	Description
1	12 volt input
2	Ground
3	Ground
4	No connect

Reset switch

A manual reset switch is mounted on the board near the serial port.

SCSI port

The SCSI port on the iPBridge 1500E connects storage devices into the Storage Area Network (SAN). The port is an Ultra 3 LVD/SE SCSI bus with 68-pin "P" interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports SCSI devices including hard disk drives, tape drives RAID controllers, DVD, MO and CD libraries.

Ethernet port

The 10/100/1000 GbE RJ45 Ethernet port uses the Intel 8254x family gigabit Ethernet to support Telnet-based data transfer and management through a an ASCII-based command line interface or ATTO ExpressNAV, a browser-based interface.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface. It is set at the factory at 115,200 bps.

Pin outs of the RJ11 connector, part number CBL-0911-001

Pin	Description
2	TXD
3	Ground
4	RXD
5	Ground

LED indicators

Activity: A green LED in the middle of the iPBridge blinks to show the unit is ready and to identify the iPBridge when the CLI command IdentifyBridge is enabled. It goes dark when there is SCSI activity.

SCSI Activity: the SCSI bus has an LED which is lit when the iPBridge is ready and goes dark when there is SCSI activity.

Exhibit 1.1-1 iPBridge 1500E board layout

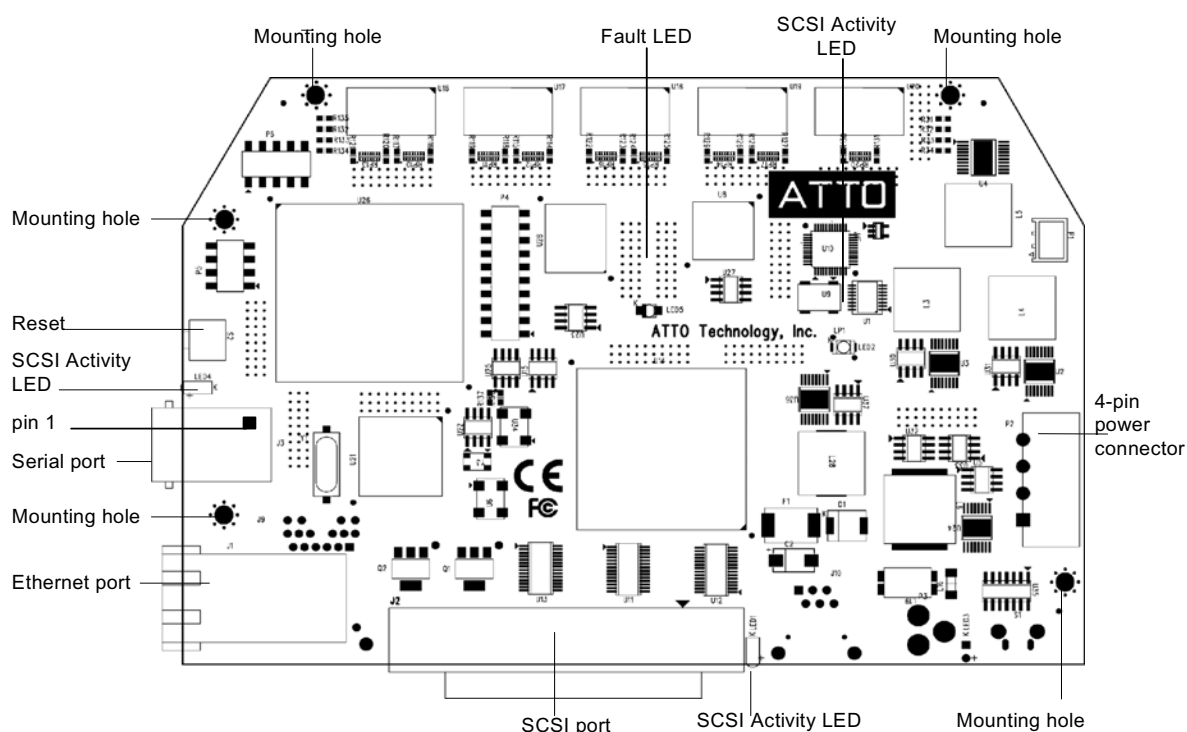
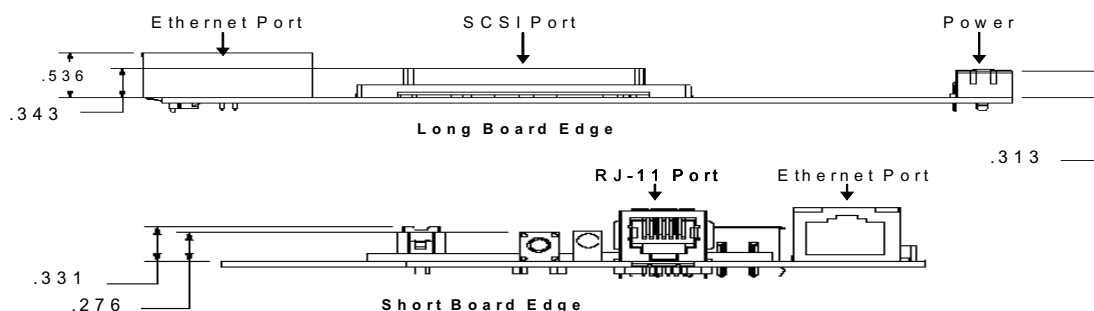


Exhibit 1.1-2 iPBridge 1500E board profile and dimensions



Installation instructions

- 1 Install the iPBridge 1500E in the target device using the mounting holes in the board. (See the board layout diagram in Exhibit)
- 2 Connect SCSI devices to the iPBridge. (See [Connecting SCSI devices to the SCSI port](#) on page 11)
- 3 Connect the iPBridge to your SAN: attach CAT 6 or CAT 5E cables to the Ethernet port on the iPBridge or connect an RJ11 and adapter crossover serial cable (null modem) between the iPBridge serial port and one of the computer's serial COM ports.
- 4 Connect the power connector and power up.
- 5 Boot the computers on the SAN.
- 6 Access iPBridge Services via the Ethernet port. (See [Configuring the iPBridge](#) on page 13) or the serial port ([Connecting using the serial port](#) on page 14)
- 7 Verify that the bridge can be accessed on the local Ethernet network by using the Ping utility. (See [Step 7](#) on page 15)
- 8 Set up the configuration for the devices connected to the iPBridge (See [Managing the iPBridge](#) on page 17.)
- 9 Power cycle the iPBridge. The iPBridge will automatically map the devices on startup

1.2 ATTO iPBridge 1500D

The ATTO iPBridge 1500D is a 1-Gigabit Ethernet to SCSI embeddable bridge for midrange performance, cost effective solutions in SMB/SME environments.

The iPBridge 1500E includes a single Ethernet port which may be used for either data transfer or configuration, a serial management port and a SCSI port.

Dimensions

Width: 7.5 inches wide

Depth: 5.0 inches long

Height: 1.76 inches



Environment

Operating Temperature: 0-70° C external

Ambient air should not exceed 40°C.

Humidity: 10-90% non-condensing

Recommended airflow: 11 cubic feet per minute.

Power

Plug in the 12 volt, 20 Watt wall mount adapter to the back of the unit, then into an appropriate power source (100-240 VAC input, 50/60 Hz).

The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit.

Input voltage: 12.0V DC $\pm 10\%$

SCSI port

The SCSI port on the iPBridge 1500E connects storage devices into the Storage Area Network (SAN). The port is an Ultra 3 LVD/SE SCSI bus with 68-pin "P" interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports SCSI devices including hard disk drives, tape drives RAID controllers, DVD and CD libraries.

Ethernet port

The 10/100/1000 GbE RJ45 Ethernet port uses the Intel 8254x family gigabit Ethernet controllers to support Telnet-based data transfer and management through an ASCII-based command line interface or ATTO ExpressNAV, a browser-based interface.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

LED indicators

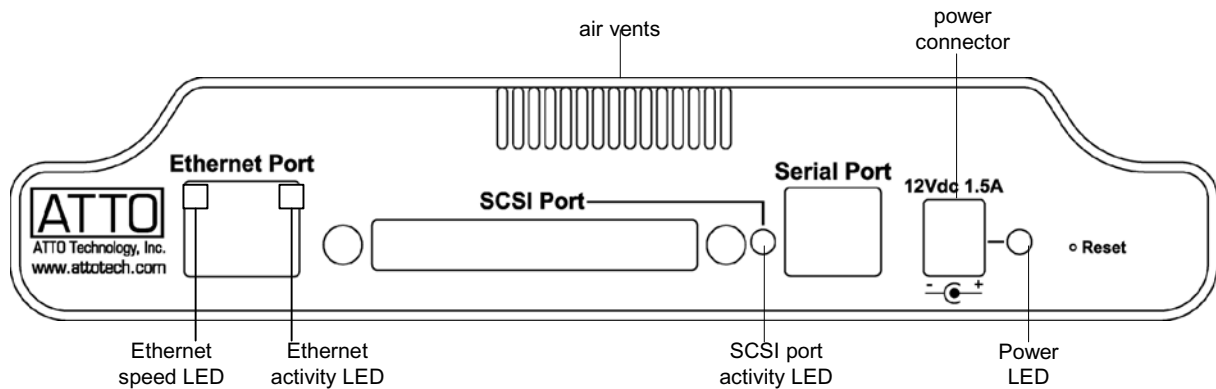
Activity: A green LED on the top of the iPBridge blinks to show the unit is ready and to identify the iPBridge when the CLI command IdentifyBridge is enabled. It goes dark when there is SCSI activity.

SCSI Activity: the SCSI bus has an LED which is lit when the iPBridge is ready and goes dark when there is SCSI activity.

Reset switch

A manual reset switch is mounted on the board. Insert a tool in the hole in the back panel to activate the switch.

Exhibit 1.2-1 iPBridge 1500D back panel



Installation instructions

- 1 Place the iPBridge 1500D where you want it.
- 2 Connect SCSI devices to the iPBridge. (See [Connecting SCSI devices to the SCSI port](#) on page 11)
- 3 Connect the iPBridge to your SAN: attach CAT 6 or CAT 5E cables to the Ethernet port on the iPBridge or connect an RJ11 and adapter crossover serial cable (null modem) between the iPBridge serial port and one of the computer's serial COM ports.
- 4 Connect the power connector and power up.
- 5 Boot the computers on the SAN.
- 6 Access iPBridge Services via the Ethernet port. (See [Configuring the iPBridge](#) on page 13) or the serial port ([Connecting using the serial port](#) on page 14)
- 7 Verify that the bridge can be accessed on the local Ethernet network by using the Ping utility. (See [Step 7](#) on page 15)
- 8 Set up the configuration for the devices connected to the iPBridge (See [Managing the iPBridge](#) on page 17.)
- 9 Power cycle the iPBridge. The iPBridge will automatically map the devices on startup.

1.3 ATTO iPBridge 1550E

The iPBridge 1550E includes a single Ethernet port which may be used for either data transfer or configuration, a serial management port and a SCSI port.

Dimensions

Length: 6.4 inches

Width: 4.4 inches

Height of the tallest component: .536 inches

Environment

Operating Temperature: 5-40° C external

Ambient air should not exceed 40°C.

Humidity: 10-90% non-condensing

Recommended airflow: 11 cubic feet per minute

Power

The iP1500E board may be powered from a 4-pin connector.

Input voltage: 12V DC $\pm 10\%$ derived from a 4-pin connection.

Power draw: 12V, 1.7 amps

4-pin power connector pin outs

Pin	Description
1	12 volt input
2	Ground
3	Ground
4	No connect

Reset switch

A manual reset switch is mounted on the board near the serial port.

SCSI port

The SCSI port on the iPBridge 1550E connects storage devices into the Storage Area Network (SAN). The port is an Ultra 3 LVD/SE SCSI bus with 68-pin "P" interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports SCSI devices including hard disk drives, tape drives RAID controllers, DVD, MO and CD libraries.

Ethernet port

The 10/100/1000 GbE RJ45 Ethernet port uses the Intel 8254x family gigabit Ethernet to support Telnet-based data transfer and management through a an ASCII-based command line interface or ATTO ExpressNAV, a browser-based interface.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

Serial port

The RS-232 serial port provides support for remote monitoring and management through a command line interface. It is set at the factory at 115,200 bps.

Pin outs of the RJ11 connector, part number CBL-0911-001

Pin	Description
2	TXD
3	Ground
4	RXD
5	Ground

LED indicators

Activity: A green LED in the middle of the iPBridge blinks to show the unit is ready and to identify the iPBridge when the CLI command IdentifyBridge is enabled. It goes dark when there is SCSI activity.

SCSI Activity: the SCSI bus has an LED which is lit when the iPBridge is ready and goes dark when there is SCSI activity.

Exhibit 1.3-1 iPBridge 1550E board layout

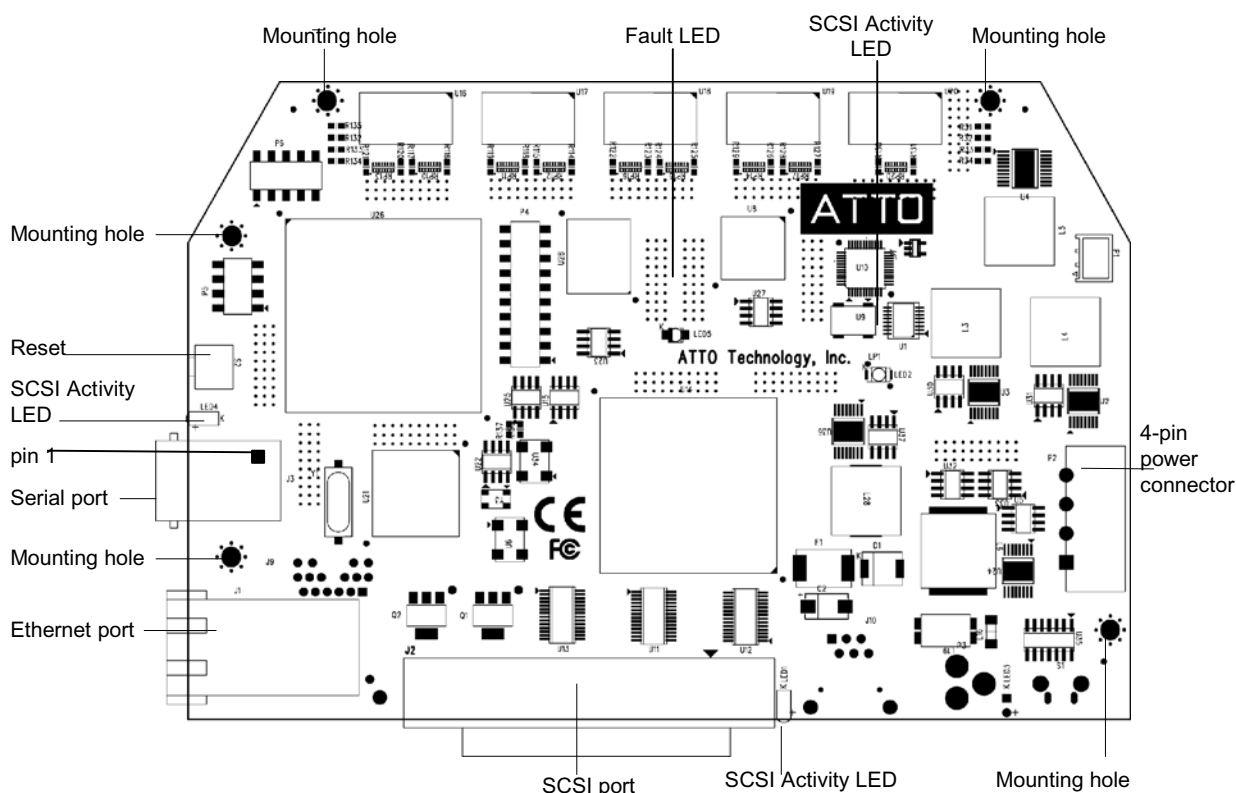
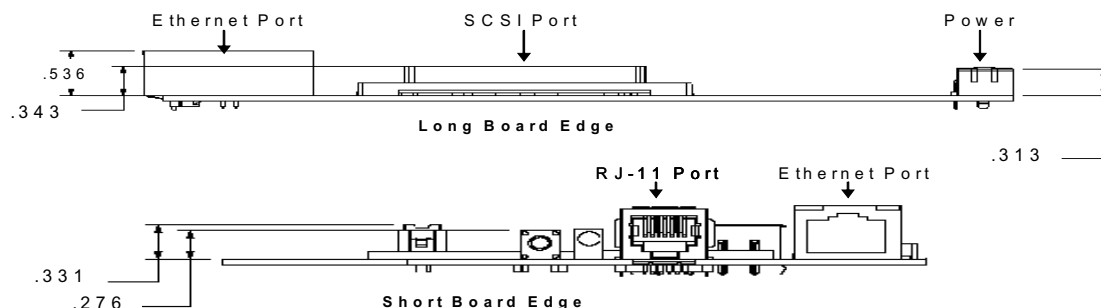


Exhibit 1.3-2 iPBridge 1550E board profile and dimensions



Installation instructions

- 1 Install the iPBridge 1550E in the target device using the mounting holes in the board. (See the board layout diagram in Exhibit)
- 2 Connect SCSI devices to the iPBridge. (See [Connecting SCSI devices to the SCSI port](#) on page 11)
- 3 Connect the iPBridge to your SAN: attach CAT 6 or CAT 5E cables to the Ethernet port on the iPBridge or connect an RJ11 and adapter crossover serial cable (null modem) between the iPBridge serial port and one of the computer's serial COM ports.
- 4 Connect the power connector and power up.
- 5 Boot the computers on the SAN.
- 6 Access iPBridge Services via the Ethernet port. (See [Configuring the iPBridge](#) on page 13) or the serial port ([Connecting using the serial port](#) on page 14)
- 7 Verify that the bridge can be accessed on the local Ethernet network by using the Ping utility. (See [Step 7](#) on page 15)
- 8 Set up the configuration for the devices connected to the iPBridge (See [Managing the iPBridge](#) on page 17.)
- 9 Power cycle the iPBridge. The iPBridge will automatically map the devices on startup

1.4 ATTO iPBridge 1550D

The ATTO iPBridge 1550D is a 1-Gigabit Ethernet to SCSI embeddable bridge for high performance, cost effective solutions in SMB/SME environments.

The iPBridge 1550E includes a single Ethernet port which may be used for either data transfer or configuration, a serial management port and a SCSI port.

Dimensions

Width: 7.5 inches wide

Depth: 5.0 inches long

Height: 1.76 inches



Environment

Operating Temperature: 0-70° C external

Ambient air should not exceed 40°C.

Humidity: 10-90% non-condensing

Recommended airflow: 11 cubic feet per minute.

Power

Plug in the 12 volt, 20 Watt wall mount adapter to the back of the unit, then into an appropriate power source (100-240 VAC input, 50/60 Hz).

The power source must be connected to a protective earth ground and comply with local electrical codes. Improper grounding may result in an electrical shock or damage to the unit.

Input voltage: 12.0V DC \pm 10%

SCSI port

The SCSI port on the iPBridge 1550E connects storage devices into the Storage Area Network (SAN). The port is an Ultra 3 LVD/SE SCSI bus with 68-pin “P” interface: 160 MB/sec. maximum throughput, downward compatible with all forms of single-ended SCSI.

The iPBridge supports SCSI devices including hard disk drives, tape drives RAID controllers, DVD and CD libraries.

Ethernet port

The 10/100/1000 GbE RJ45 Ethernet port uses the Intel 8254x family gigabit Ethernet controllers to support Telnet-based data transfer and management through an ASCII-based command line interface or ATTO ExpressNAV, a browser-based interface.

GbE cables must be at least CAT-5E certified for 1000 Mb/sec. use.

LED indicators

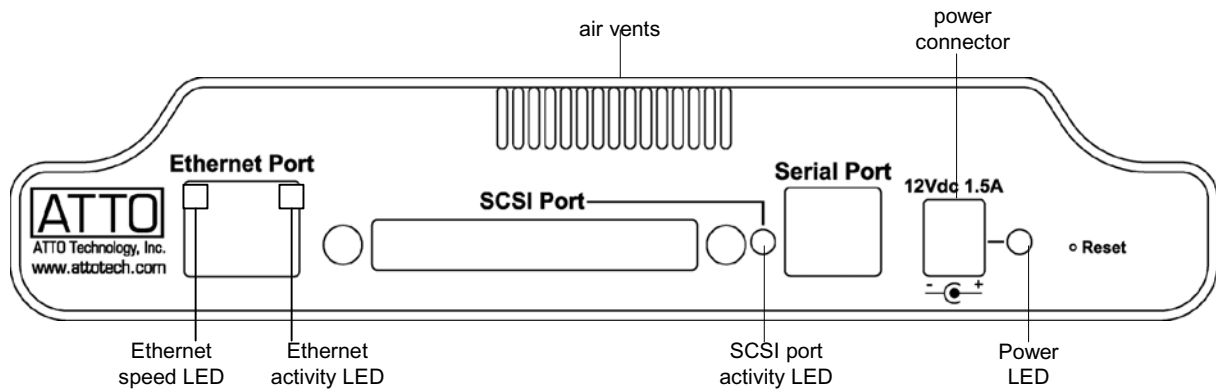
Activity: A green LED on the top of the iPBridge blinks to show the unit is ready and to identify the iPBridge when the CLI command IdentifyBridge is enabled. It goes dark when there is SCSI activity.

SCSI Activity: the SCSI bus has an LED which is lit when the iPBridge is ready and goes dark when there is SCSI activity.

Reset switch

A manual reset switch is mounted on the board. Insert a tool in the hole in the back panel to activate the switch.

Exhibit 1.4-1 iPBridge 1550D back panel



Installation instructions

- 1 Place the iPBridge 1550D where you want it.
- 2 Connect SCSI devices to the iPBridge. (See [Connecting SCSI devices to the SCSI port](#) on page 11)
- 3 Connect the iPBridge to your SAN: attach CAT 6 or CAT 5E cables to the Ethernet port on the iPBridge or connect an RJ11 and adapter crossover serial cable (null modem) between the iPBridge serial port and one of the computer's serial COM ports.
- 4 Connect the power connector and power up.
- 5 Boot the computers on the SAN.
- 6 Access iPBridge Services via the Ethernet port. (See [Configuring the iPBridge](#) on page 13) or the serial port ([Connecting using the serial port](#) on page 14)
- 7 Verify that the bridge can be accessed on the local Ethernet network by using the Ping utility. (See [Step 7](#) on page 15)
- 8 Set up the configuration for the devices connected to the iPBridge (See [Managing the iPBridge](#) on page 17.)
- 9 Power cycle the iPBridge. The iPBridge will automatically map the devices on startup.

1.5 Connecting SCSI devices to the SCSI port

The ATTO iPBridge SCSI port connects SCSI storage devices to the network.

The SCSI port is a bus capable of supporting up to 15 devices in LVD mode and each bus is capable of 40, 80 or 160 MB/sec. (Ultra, Ultra2 or Ultra3) transfer rates.

The SCSI bus auto-negotiates the appropriate sync rates with the connected devices. If slower devices are mixed with faster devices, the bus will communicate at the rate of the slowest device, thus wasting the performance capabilities of the faster devices.

The iPBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, RAIDs, tape, CD and DVD drives, changers and libraries.

To connect SCSI devices to the ATTO iPBridge

- 1 Connect the cable from the SCSI device to the 68-pin HD SCSI port on the iPBridge.
- 2 Check the type of cable, cable length limit and number of devices recommended for the port. See Exhibit 1.5-1.
Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.
- 3 Set the IDs of the SCSI devices connected to the bridge to a value other than 7.
Use a sequential ID starting at 0 for each device. The SCSI port in the ATTO iPBridge has an internal factory setting ID of 7, typical for a SCSI initiator device.



Note

The entire SCSI bus will operate at the speed of the slowest device on that bus.

- 4 Terminate the SCSI bus after the last device. The iPBridge is terminated internally.

To set SCSI port bus speed and transfer rates



Note

The preferred method to set parameters for the iPBridge is to use ATTO ExpressNAV. Refer to [Configuring the iPBridge](#) on page 13 and [ExpressNAV provides web-based interface](#) on page 19.

- 1 Enter the Command Line Interface (see [Configuring the iPBridge](#) on page 13)
- 2 Determine the current speed and transfer rates: type

```
get SCSIPortBusSpeed
get SCSIPortSyncTransfer
```

- 3 SCSIPortBusSpeed controls the transfer rate at which the iPBridge will attempt to negotiate with its SCSI devices. Default is Ultra3

To change from the default or the current port bus speed, type

```
set SCSIPortBusSpeed sb [fast|ultra|ultra2|ultra3]
```

with sb being the SCSI bus number (0) and the speeds being Fast, Ultra, Ultra2 or Ultra3. See Exhibit 1.5-1.

- 4 If you have completed configuration operations, type `SaveConfiguration`; if not, go on to the next command.
- 5 SCSIPortSyncTransfer specifies whether synchronous SCSI transfers should be negotiated with devices on the SCSI port. The default is enabled. To change the setting, type

```
set SCSIPortSyncTransfer sb disabled
```

- 6 When you have completed configuration operations, type `SaveConfiguration` to save the configuration for use after a power up or firmware restart.

Cabling

Cables and devices must be chosen to maximize performance and minimize the electrical noise from the high-speed data transfers available with the SCSI protocol. Cabling and termination methods become important considerations for proper performance. SCSI cables and devices are subject to specific length and number limitations to deal with electrical problems that arise at increased operating speeds.

Cable types

Use high-quality cables rated for the type of SCSI transfers required: well-insulated SCSI cables ensure error free communications. Try to keep cable lengths as short as possible to ensure higher signal quality and performance.

Examples

The SCSI specification limits total bus cable length for single-ended SCSI in a non-UltraSCSI environment to 3 meters (combined length of both internal and external cable lengths).

In an UltraSCSI workgroup environment with a 7-drive tower, you are limited to 1.5 meters between the host and the tower, including the cabling for the tower. If the 7-drive tower requires 1 meter of cabling to connect all of its drives, the distance from the tower to the host must be .5 meters.



Note

UltraSCSI is very sensitive to SCSI bus noise, cable distances and the number of devices connected on the SCSI bus. Carefully connect your devices when working with UltraSCSI.

Exhibit 1.5-1 Various types of SCSI operate at different speeds and require different bus lengths to support a certain number of devices.

STA terms	Bus speed MB/sec. max.	Bus width bits	Max. bus lengths in meters			Max. device support
			Single-ended	Differential	LVD	
Fast SCSI	10	8	3	25	n/a	8
Fast/WIDE SCSI	20	16	3	25	n/a	16
UltraSCSI	20	8	1.5	25	n/a	8
Ultra/WIDE SCSI	40	16	n/a	25	n/a	16
Ultra/WIDE SCSI	40	16	1.5	n/a	n/a	8
Ultra/WIDE SCSI	40	16	3	n/a	n/a	4
Ultra2 SCSI	80	16	n/a	n/a	12	8
Ultra2/WIDE SCSI	80	16	n/a	n/a	12	16
Ultra3/WIDE SCSI	160	16	n/a	n/a	12	16

1.6 Configuring the iPBridge

Communicate with the ATTO iPBridge through the GbE port using ATTO ExpressNAV or Telnet or through the serial port.

The preferred method to communicate with and manage the iPBridge is through the GbE port using ATTO ExpressNAV, a GUI web-based interface. ATTO QuickNAV, a utility program,

automatically finds your iPBridge on the network so that you can begin configuration.

You may use the Command Line Interface through the serial port or through the GbE port using Telnet.

Connecting using the GbE port

Before you begin installing the iPBridge, be sure to check or complete the following

- 1 If you are managing your iSCSI system across a WAN and your system uses a firewall, be sure that the following ports are open and available:

If you are using the TCP protocol

- telnet (port 23)
- http (port 80)
- ftp (ports 20 and 21)
- iscsi (port 3260)
- iSNS (port 3705)

If you are using the UDP protocol

- ntp (port 123)
- SNMP (port 161)

- 2 Be sure your host system(s) is set up and configured. Your host system can use any of three different types of cards:
 - a network interface card (NIC)
 - a TCP offload engine card (TOE) or
 - a storage network interface card (SNIC).
- 3 For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring.
- 4 For best performance, support for 9014 byte jumbo frames should be available for all switches and host iSCSI equipment.
- 5 Ensure that the iPBridge has access to a DHCP server.

- 6 Download the ATTO QuickNAV utility, **QuickNAV-windows.exe**, from the ATTO website, www.attotech.com, or from the product CD.
- 7 Ensure the host running QuickNAV and the iPBridge are on the same subnet.
- 8 Any switch in the IP SAN network must allow UDP broadcast messages to be passed through.
- 9 You do not have a router between the host running QuickNAV and the iPBridge.
- 10 You have the iPBridge serial number.

To find the iPBridge

- 1 Using at least Cat5e cable, connect the iPBridge Ethernet port to your network.
- 2 Power on the iPBridge.
- 3 Wait approximately one minute to insure the iPBridge obtains an IP address from the DHCP server.
- 4 Run the QuickNav Utility **QuickNAV-windows.exe** which you previously downloaded from the ATTO website, www.attotech.com, or from the product CD:
- 5 Follow the on-screen instructions. You will need the iPBridge serial number.
- 6 Continue to configure and manage the iPBridge using the ExpressNAV interface. Refer to [Using ATTO ExpressNAV](#) on page 14

If any problem occurs, continue with [Connecting using the serial port](#) below.

Using ATTO ExpressNAV

ATTO ExpressNAV is the recommended management tool for the iPBridge. It is a web-based graphical user interface (GUI) that allows you to manage the iPBridge by clicking choices and commands in traditional GUI fashion or by entering Command Line Interface commands directly, as you would in a terminal emulation session.

The minimum requirement for browsers is Internet Explorer 5.5 or Netscape Navigator 6.2. Access from any web browser that supports the latest standards for XHTML 1.0 and CSS1. To make ExpressNAV as compatible as possible with as many browsers as possible, all pages are written in pure XHTML 1.0 and CSS1. It is compatible with the latest versions of Internet Explorer, Netscape, Mozilla (including K-Meleon, Camino, Mozilla Firefox, Epiphany and Galeon), and KHTML (including Konqueror and Safari).

To take full advantage of the ExpressNAV interface, enable Java script through your browser.

To optimize ExpressNAV in Internet Explorer

- 1 Go to the browser toolbar and select **Tools**

Connecting using the serial port

- 1 Connect an RJ11 part number CBL-0911-001 and adapter crossover serial cable (null modem) between the ATTO iPBridge serial port and one of the computer's serial COM ports.

A gender changer or DB-9 to DB-25 converter may be needed depending on the cables being used.

- 2 Enable the computer's serial port and initiate a terminal emulation link.
- 3 Set the following serial parameters in your terminal program:
 - Bits per second: 115200
 - Data Bits: 8
 - Parity: None
 - Stop Bits: 1
 - Flow Control: None

- 2 Select **Internet Options**
- 3 Select the **Security** tab
- 4 Select the **Custom Level** button.
- 5 On the menu presented, go to the **Microsoft VM, Java permissions** and make sure **Disable Java** is *not* selected.
- 6 Go to the **Miscellaneous** topic and select **METAREFRESH**.

To use ATTO ExpressNAV

- 1 Once the iPBridge is found, click the **Launch** button to open the ExpressNAV web browser.
- 2 The ExpressNav home page displays. Click **Enter**.
- 3 Enter the username and password. The default values are username "root" and password "Password".



Note

The username is case insensitive and the password is case sensitive.

- 4 The ExpressNAV iPBridge **Status** page appears. Configure your iPBridge using the ExpressNAV interface. Refer to [ExpressNAV provides web-based interface](#) on page 19, ending with the **SaveConfiguration Restart** from the **Restart** page.

- Terminal type: ASCII
- Echo: on.

- 4 Press **Enter** several times until the **Ready** prompt is displayed.
- 5 Disable DHCP by typing
`set ipdchp dp0 disabled`
- 6 To configure the IP address, type
`set ipaddress dp0 w.x.y.z`
where w.x.y.z is an addressable address for your network.
- 7 To configure the subnetmask, type
`set ipsubnetmask dp0 a.b.c.d`
where a.b.c.d is the subnet you want the iPBridge to be available.
- 8 To configure the gateway, type


```
set ipgateway dp0 e.f.g.h
    where e.f.g.h is a valid gateway.
```

9 To save the settings, type

```
saveconfiguration restart
```

The iPBridge will save the changes and perform a restart.

- 10 Once rebooted, verify that the iPBridge can be accessed by your network using standard network techniques such as the **ping** command.

Using Telnet

Up to three Telnet sessions can be conducted simultaneously. Whichever session issues the first “set” Command Line Interface command (refer to [CLI provides ASCII-based interface](#) on page 21) can continue to issue set commands, while the other sessions can only issue “get” commands or display information. Once a connection is established, refer to [CLI commands summary](#) on page 23 for lists of valid commands.

To connect using Telnet

- 1 Connect through the GbE port as outlined in [Connecting using the GbE port](#) using a computer on the same Ethernet network.
- 2 Start a Telnet session.



Note

There is more than one way to connect to the iPBridge using a telnet program. Your telnet program may operate differently than in the following instructions.

- 3 Obtain the IP Address for the iPBridge from your system administrator. The default address is 10.0.0.3

- 4 At the telnet prompt, issue the open command:

```
telnet > open x.x.x.x
```

where x.x.x.x is the IP address of the iPBridge.

- 5 If you have to specify a port type, enter the port type “telnet” and the terminal type “vt100”.

```
port type:telnet
```

```
terminal type: vt100
```

- 6 Enter the default values for the username, “root”, and the password, “Password”.



Note

The username is case insensitive and password is case sensitive.

- 7 To verify that you have connected successfully, type `help` after the Ready prompt and press **Enter**.
 - If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.
 - If you wish to change the default username and password for world wide web, Telnet and FTP use, continue with the section [To change the default administrator password](#) on page 17.

2 Managing the iPBridge

Default values are appropriate for most configurations, but may be modified for your needs using CLI commands or ATTO ExpressNAV.

ATTO iPBridge Services configures and tunes the iPBridge for many different environments and applications, updates the firmware, configures the addresses of the connected SCSI devices, monitors status and reports on hardware.

Communicate with the ATTO iPBridge through the GbE management port using ATTO ExpressNAV or Telnet or through the serial port using standard terminal emulation software.



Note

ATTO ExpressNAV is the recommended management tool for the iPBridge

- Refer to [Configuring the iPBridge](#) on page 13 to set up ExpressNAV and Telnet.
- To use ExpressNAV, refer to [ExpressNAV provides web-based interface](#) on page 19.
- To use the Command Line Interface during a Telnet session or from the **Advanced Page** of ExpressNAV, refer to [CLI provides ASCII-based interface](#) on page 21.



CAUTION

Any changes must be saved and will not take effect until the ATTO iPBridge is restarted.

Some completed configuration commands do not take effect until you have issued the saveConfiguration command. When this is the case, the Ready prompt will be followed by asterisk. You can issue the saveConfiguration command after each such configuration command or wait until you have entered all the parameters you wish to change.

Change default username, password

It is best practice to change the default username and password after you have configured your

iPBridge. If you do so, record the new username and password in a convenient place.

To change the default administrator password

- 1 If you have not already, open an ExpressNAV session.
For instructions, refer to [To open an ExpressNAV session](#) on page 19.
- 2 Click **Bridge**.
The **Bridge Configuration** page is displayed. The username that you are currently logged in with is displayed in the **Username** text box.
- 3 Enter appropriate information into the **Username**, **Current Password**, **Old Password**, **New Password**, and **Confirm Password** text boxes.



Note

The username is case insensitive and password is case sensitive.

- 4 Click **Submit**.
- 5 The username and password for all Telnet, FTP and ATTO ExpressNAV sessions is changed.

You may also set a read only password or a read only username. Refer to [General use commands](#) on page 25.

SCSI configuration

Default values are appropriate for most configurations, but may be modified for your needs using CLI commands. Refer to [SCSI configuration commands](#) on page 31 for more information.

You may change the InitID, the port bus speed, termination, sync transfers, type of transfers, performance speed and the way the ports respond to resets. You may also get information on these parameters, a list of SCSI ports and their timeouts.

Ethernet port configuration

Default values are appropriate for most configurations, but may be modified for your needs using CLI commands. Refer to [Ethernet commands](#) on page 35 for more information. Commands control the MTU or Maximum Transmission Unit, Ethernet speed, the IP address, gateway and subnet mask, and set the password and username.



Note

Ethernet speed settings in the host must be the same as Ethernet speed settings in the iPBridge. The iPBridge default Ethernet speed is auto: your host must be set to auto. If you set Ethernet speed to 10, your host must be set to Ethernet speed 10, half duplex. If you set Ethernet speed to 100, your host must be set to Ethernet speed 100, half duplex.

iSCSI configuration

Commands set a human-readable name to the iPBridge, provide passwords and authentication for iSCSI sessions, and specify whether or not the iPBridge uses an ISNS server.



Note

If you are using Microsoft Initiator, use the latest drivers.



Note

If using Windows XP, make sure you have Windows XP Service Pack 1 from Microsoft to enable iSCSI.

Mapping

The iPBridge by default automatically maps devices on startup. You may change mapping using ExpressNAV, the web-based server, or by using CLI through the Ethernet or serial port. Refer to [Mapping devices](#) on page 43 and [Mapping commands](#) on page 39.

OEM configuration services

Privileged OEM configuration services perform OEM-specific product branding and labeling functions only available to OEM customers such as vendor, product, and model number identification during power up display.

These commands may only be “set” from within an OEM config file and the commands do not result in reservation of the iPBridge. The information in a “get” command may only be displayed within a TTY CLI session. These commands will not be displayed in the help menu. Refer to [Privileged OEM configuration services](#) on page 41 for more information.

2.1 ExpressNAV provides web-based interface

Each page in the ATTO ExpressNAV interface provides information and/or configuration parameters based on a specific topic.

ATTO ExpressNAV is the recommended management tool for the iPBridge. It is a web-based graphical user interface (GUI) that allows you to manage the iPBridge by clicking choices and commands in traditional GUI fashion or by entering CLI commands directly, as you would in a terminal emulation session.

Before opening an ExpressNAV session, you must install the ExpressNAV interface. Refer to [Configuring the iPBridge](#) on page 13.

To open an ExpressNAV session

- 1 Point your browser at the IP address of the iPBridge. Refer to [Configuring the iPBridge](#) on page 13.
- 2 The **ExpressNAV** home page is displayed. Click **Enter**.
- 3 Enter the username and password values.



Note

The default values are username: "root" and password: "Password". The username is case insensitive and password is case sensitive.

The **Status** page appears. Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and will also take you to the appropriate page.

Status

Displays iPBridge information

- Vendor ID
- Product ID
- Firmware revision number
- Serial number
- Ethernet port IP addresses
- Ethernet port status

Serial Port Configuration

Configure the baud rate and echo parameters. See [Serial port configuration commands](#) on page 33 for details on each option.

Ethernet Port Configuration

Configures each port independently for the following parameters

- Enable/disable DHCP
- IP address
- IP gateway
- IP subnet mask
- Ethernet speed
- MTU



Note

Ethernet speed settings in the host must be the same as Ethernet speed settings in the iPBridge. The iPBridge default Ethernet speed is auto: your host must be set to auto. If you set Ethernet speed to 10, your host must be set to Ethernet speed 10, half duplex. If you set Ethernet speed to 100, your host must be set to Ethernet speed 100, half duplex.

See [Ethernet commands](#) on page 35 for details on each parameter.

SCSI Configuration

Displays include a list of attached devices for the SCSI bus. Configurable options are

- Port Bus Speed
- Synchronous Transfer
- Wide Transfer
- Initiator ID
- Bus Reset on Startup
- Bus Termination
- SCSI Port Reset

See [SCSI configuration commands](#) on page 31 for details on each parameter.

iSCSI Configuration

Configurable options are

- iSCSI Alias
- iSCSI Port Number
- iSNSLoginControl
- iSNSServer
- CHAP settings: account name and secret
- CHAP direction (in, out)

See [iSCSI commands](#) on page 37 for details on each parameter.

Bridge Configuration

Configurable options are

- User name and current password
- Old Password
- New Password
- Confirm Password
- Bridge name
- Identify Bridge
- Restore Defaults

See [Maintenance commands](#) on page 29 for details on each parameter.

Mapping

While the iPBridge maps devices automatically at startup by default, you may change mapping using the ExpressNAV Mapping page. See [Mapping devices](#) on page 43 and [Mapping commands](#) on page 39 for details.

Advanced CLI Configuration

Allows you to input any CLI command available through the iPBridge.

To use the Advanced Configuration page

- 1 Type in the CLI command
- 2 Click the **Submit** button: this is equivalent to typing in the CLI command into a Telnet or serial port CLI session.

A text field beneath the box will list the most recent commands issued to the iPBridge through this page.

If you enter an incorrect parameter, the CLI help text will be displayed, showing the parameters available.

- 3 If you are using a “set” command and the entry was correct, type saveconfiguration restart to make the changes persistent or click the **Submit** button to implement changes immediately.

Restart Firmware

Implements a firmware restart of the bridge and makes permanent any changes you have made since the last firmware restart.



Note

Restarting the firmware may take a few minutes.

- 1 Click the **Restart** button.
A box will tell you to wait until the counter gets to 0 and then the browser will refresh.
- 2 If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.

Help

Gives help information about the command line interface commands and troubleshooting tips via links to pages with help text for each category of options and one link to the Troubleshooting Tips and FAQs page on the ATTO website, www.attotech.com.

Contact information for ATTO technical support is on the right.

Help is always available by pressing any word shown in red on the screen.

2.2 CLI provides ASCII-based interface

The command line interface (CLI) provides access to the ATTO iPBridge Services through a set of ASCII commands. CLI commands may be entered while in CLI mode.

iPBridge Services provide configuration and monitoring for the iPBridge. CLI commands may be entered while in a Telnet session or on the ExpressNAV interface **Advanced CLI** page using the Ethernet port or while in a Telnet or standard emulation program using the serial port.

- CLI commands are context sensitive and generally follow a standard format

```
[Get | Set] Command [Parameter 1 |  
Parameter 2]
```

followed by the **return** or **enter** key

- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the help screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.

Responses to get commands are specified in the Results field for each command, followed by Ready.

- The set form is an action that changes the value of a parameter or configuration setting. It may require a SaveConfiguration command and a restart of the system before it is implemented. The restart can be accomplished as part of the SaveConfiguration command or by using a separate FirmwareRestart command. A number of set commands may be issued before the SaveConfiguration command.

Responses to set commands are either an error message or Ready. *. The asterisk indicates you must use a SaveConfiguration command to finalize the set command. SaveConfiguration will ask if you want to restart the system or not.

- Set commands which do not require a SaveConfiguration command, defined as immediate commands, are immediately executed.

Responses to Immediate commands are either an error message or data results followed by Ready.

Exhibit 2.2-1 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.

Command conventions

Symbol	Indicates	Symbol	Indicates
[]	Required entry	Boldface words	must be typed as they appear
< >	Optional entry	Italicized words	Arguments which must be replaced by whatever they represent
	pick one of	Dp	Data port
...	Ellipses, repetition of preceding item	sb	SCSI bus number (0<= sb <= 1)
\n	end of line	sl	SCSI LUN ID (0 <= sl <= 7)
-	a range (6 – 9 = 6, 7, 8, 9)	st	SCSI target ID (0 <= st <= 15)

2.2.1 CLI commands summary

A summary of the Command Line Interface commands, their defaults, an example of how they might be used, and where you can find the specifics of the command. Commands which have no default values associated with them have a blank entry in that column of the table.

Command	Defaults	Example	Page
AutoMap		automap	39
BridgeModel		get bridgemodel	27
BridgeName	iPBridge	set bridgename Omega6	27
DPMTU	1514	set dpmtu dp0 9014	35
EthernetSpeed	auto	set ethernetspeed dp0 100	35
Exit		exit	35
FirmwareRestart		firmwarerestart	29
Help		help exit	25, 27
IdentifyBridge	disabled	set identifyBridge enabled	27
Info		info	27
IPAddress	10.0.0.1	get ipaddress dp0	35
IPDHCP	enabled	set ipdhcp dp0 disabled	35
IPGateway	0.0.0.0	set ipgateway dp0 1 200.10.22.3	35
IPSubnetMask	255.255.0.0	get ipsubnetmask dp0	35
iSCSIAlias	“ “	set iscsialias diamond	37
iSCSIChap	disabled	set iscsichap enabled	37
iSCSIChapSecret	“ “	set iscsichapsecret in Data1 barbara556d12345	37
iSCSIPortNumber	3260	get iscsiportnumber	37
iSCSITarget	disabled	set iscsitarget enabled	37, 39
iSNSLoginControl	disabled	set isnslogincontrol enabled	37
iSNSServer	0.0.0.0	get isnsserver	38
IsReserved		isreserved	27
MultiTargetMode	disabled	get multitargetmode	38, 39
OEMConfigFile	ATTO	get oemconfigfile	27, 42
Password	Password	set password	29, 35
Ping		ping 192.42.155.155	36
ReadOnlyPassword	Password	get readonlypassword	36
ReadOnlyUsername	user	get readonlyusername	36
Reserve		reserve disabled	29
RestoreConfiguration		restoreconfiguration default	25, 29
RMON			36
Route		route iscsi 2 scsi 0 1 0	39
RouteDisplay		routedisplay iscsi	39
SaveConfiguration		saveconfiguration restart	25

Command	Defaults	Example	Page
SCSIInitID	7	set scsiinitid 0 1	31
SCSIPortBusSpeed	Ultra3	set scsiportbusspeed 0 fast	31
SCSIPortList		scsiportlist	28, 31
SCSIPortReset		scsiportreset 0	29, 31
SCSIPortResetOnStartup	enabled	set scsiportresetonstartup 0 disabled	31
SCSIPortSelTimeout	256ms	get scsiportseltimeout 0	31
SCSIPortSyncTransfer	enabled	set scsiportsynctransfer 0 disabled	31
SCSIPortTermination	enabled	set scsiporttermination 0 disabled	31
SCSIPortWideTransfer	enabled	get scsiportwidetransfer 0	31
SCSITargets		scsitargets 0	28, 31
SerialPortBaudRate	115200 baud	set serialportbaudrate 19200	33
SerialPortEcho	enabled	get serialportecho	33
SpeedWrite		get speedwrite scsi all	31
SpeedWriteDefault	disabled	set speedwritedefault enabled	31
Username	root	set username Barbara	29, 36
VerboseMode	Enabled	set verbosemode disabled	25

OEM configuration file	Defaults	Limits	Page
AutoMapOnReboot	Enabled		41
ColdReset	Enabled		41
InquiryProductID	iPBridge 1500	maximum 16 characters	41
InquiryVendorID	ATTO	maximum 8 characters	41
IqnVendorPrefixID	iqn.19995-12.com.attotech:ipbridge		41
ModelNumber	1500	maximum 8 characters	42
ProductID	iPBridge	maximum 16 characters	42
VendorID	ATTO	maximum 8 characters	42

2.2.2 General use commands

These CLI commands are used in a variety of situations

Help

Displays a list of available commands. If command name is specified, displays detailed command-specific information.

Immediate command: Help [command name]

Password

Specifies a password for all sessions: Telnet, FTP and ExpressNAV web-based interface. You will be prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command RestoreConfiguration default sets the password to its default value.

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

ReadOnlyPassword

Specifies a read only password for all sessions: Telnet, FTP and ExpressNAV web-based interface. You will be prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command RestoreConfiguration default sets the password to its default value.

Default: Password

Set syntax: set ReadOnlyPassword

Requires a SaveConfiguration command

ReadOnlyUsername

Specifies a read only username for all Telnet, FTP and ExpressNAV web server sessions. Username is case insensitive, 1-32 characters with no spaces.

Default: user

Set syntax: set ReadOnlyUsername [username]

Requires a SaveConfiguration command

Get syntax: get Username

RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option will undo any changes made since the last save.

Immediate command: RestoreConfiguration [Default | Saved]

SaveConfiguration

Many commands require a SaveConfiguration command to be executed. This will be indicated by the return

*Ready. *.*

When you invoke SaveConfiguration, the current configuration is permanently saved in the iPBridge and the new configuration becomes the active configuration.

If a firmware restart is required to make the requested change permanent, you will see a prompt asking you to confirm the restart. You can override this request by indicating the override value on the command line.

You may make several changes through commands and SaveConfiguration before implementing the restart, but once you have restarted the iPBridge, all the command changes created before the restart and save will be implemented. If you select the restart option, the iPBridge will execute its complete start up cycle.

Restart or no Restart parameter is optional

Immediate command: SaveConfiguration <Restart|NoRestart>

Username

Specifies a username for all Telnet, FTP and ExpressNAV web server sessions. Username is case insensitive, 1-32 characters with no spaces. You must be using the Admin password to change Username.

Default: root

Set syntax: set Username [username]

Requires entering a password

Requires a SaveConfiguration command

Get syntax: get Username

VerboseMode

Specifies the detail of feedback for the command line interface. Disabling this option removes parameter names from action commands and removes descriptions

from information commands. Choices are enabled or disabled

Default: enabled (returns have parameter information)

Set syntax: set VerboseMode [enabled | disabled]

Get syntax: get VerboseMode

2.2.3 Diagnostic commands

ATTO iPBridge diagnostic commands help validate iPBridge operation and diagnose/isolate iPBridge faults.

BridgeModel

Reports model information about a specific iPBridge

Get syntax: get BridgeModel

BridgeName

Specifies name used to identify individual iPBridge units. May be up to a maximum of eight characters. It is not the World Wide Name (WWN).

Set syntax: set BridgeName [value]

Requires a SaveConfiguration command

Get syntax: get BridgeName

Help

Displays a list of available commands. If command name is specified, displays detailed command-specific information.

Immediate command: Help [command name]

IdentifyBridge

Enabling this option causes the LED on the top panel of the iPBridge 1500/1550D or the activity LED on the iPBridge 1500/1550E to blink until the parameter is disabled.

Default: disabled

Set syntax: set IdentifyBridge [enabled|disabled]

Get syntax: get IdentifyBridge

Info

Displays version numbers and other production information for key components within the iPBridge

Immediate command: Info

IsReserved

Displays the reservation status of the current iPBridge session/interface.

If set, the configuration image is being modified by another iPBridge services session: set commands are temporarily unavailable but information commands are available.

Executing a SaveConfiguration, RestoreConfiguration or FirmwareRestart RELEASES the iPBridge so that other services users may access it.

When iPBridge services interface is RESERVED, set commands from other users are unavailable.

At least one interface must always have access to the iPBridge.

Immediate command: IsReserved

OEMConfigFile

Reports the name of the OEM Configuration file stored in persistent memory. If no file is present, ATTO is returned. The file contains all the CLI commands that can be used to override the factory default settings of the iPBridge. Updates may be loaded via any of the current firmware update methods.

Get syntax: get OEMConfigFile

Ping

Ping will send an ICMP echo request to the specified host.

Immediate command: ping dp0 [xxx.xxx.xxx.xxx] <count <size>>

RMON

RMON collects and stores Ethernet data on data ports at specified intervals. You can display the entire table requested, or a single entry based on the index (and sample index for the Ethernet History table).

Entries in the Ethernet History table are not valid when their Sample Index is 0.

Setting the history control entries take effect immediately, but changes must be saved to be persistent over a reboot.

Valid range for EthernetStat index: 1-3

Valid range for historyControl and EthernetHistory index: 1-6

Valid range for historyControl buckets requested: 1-180

Valid range for historyControl interval: 1-3600

Default historyControl table (buckets and interval in hexadecimal): Refer to Exhibit 2.2.7-1 on page 36.

Set syntax: set RMON idx bucketsRequest interval [valid|invalid]

Get syntax for entire table: get RMON [ethernetStat | historyControl] <idx>

Get syntax for single index entry: get RMON ethernetHistory <idx sampleIdx>

RouteDisplay

Displays a list of host protocol to SCSI address mappings on the bridge. If MultiTargetMode has been enabled, the

optional Target Name parameter limits the list to the maps which satisfy a search for the given target name. In either mode, the optional LUN parameter will limit the list to the map which satisfies a search for the given LUN.

NumEntries: decimal number of map lines displayed

Target Name: target name

Lun : target LUN

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command, single target mode:

RouteDisplay iSCSI <lun>

Immediate command, multiple target mode:

RouteDisplay iSCSI <Target Name> <lun>

SCSIPortList

Returns a list of available SCSI ports and their current status

Immediate command: SCSIPortList

SCSITargets

Returns a list of SCSI devices operational on the SCSI port.

Immediate command: SCSITargets 0

CLI Error Messages

The following error messages may be returned by the Command line Interface:

ERROR. Invalid Command. Type 'Help'
for command list.
ERROR. Wrong/Missing Parameters

Usage: <usage string>
ERROR. Command Not Processed.

Exhibit 2.2.3-1 If you enter a parameter for a CLI command incorrectly, the CLI help file will display with the error message:

Incorrect entry	→	Ready.
Error message		get ethernetspeed 0
including correct parameters		
as listed in Help	→	ERROR Wrong/Missing Parameters
		Usage:
		[set get] EthernetSpeed [dp
		[0 1] mp] [10 100 1000 auto]
Correct entry	→	Ready.
Response	→	get ethernetspeed dp0
		EthernetSpeed = auto (1000)
		Ready.

2.2.4 Maintenance commands

The CLI commands outlined in this chapter may be used to get information or perform functions which are used in a variety of situations with the ATTO iPBridge.

FirmwareRestart

Causes the iPBridge to reboot, then re-initialize its firmware.

Immediate command: FirmwareRestart

Password

RestoreConfiguration default sets the password to the default value

Passwords are case sensitive, 0-32 characters with no spaces

When the password is all 0s, Telnet and ftp do not validate the password and MD5 authentication are disabled.

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

Reserve

Reservation of the iPBridge is implicit: once the configuration image is changed by any user of services, the iPBridge becomes RESERVED. Executing a SaveConfiguration or \ Restore configuration RELEASES the iPBridge so that other services users may access it. When iPBridge services interface is RESERVED, set commands from other users are unavailable.

At least one interface must always have access to the iPBridge.

Immediate command: Reserve

RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option will undo any changes made since the last save.

Immediate command: RestoreConfiguration [Default | Saved]

SCSIPortReset

Resets the specified SCSI bus.

Immediate command: SCSIPortReset [sb]

SpeedWrite

When enabled, improves the performance of FCP WRITE commands to SCSI devices attached to the iPBridge.

Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device

Set syntax: set SpeedWrite SCSI [sb st sl | all]
[enabled|disabled]

Get syntax: get SpeedWrite SCSI [sb st sl|all]

SpeedWriteDefault

When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the iPBridge will not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.

Default: disabled

Set syntax: set SpeedWriteDefault [enabled | disabled]

Get syntax: get SpeedWriteDefault

Username

Specifies username for all Telnet, FTP and ExpressNAV web server sessions. The username is case insensitive, 1-32 characters, no spaces. You must have the Admin password to change Username.

Default: root

Set syntax: set Username [username]

Requires a SaveConfiguration command

Get syntax: get Username

2.2.5 SCSI configuration commands

The SCSI ports are configured with default settings but may be customized to your specifications using the CLI commands in this section.

SCSIInitID

Specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIInitID must be set to offline and will become invalid upon issuing this command. Choices are 0 to 15.

Default: 7

Set syntax: set SCSIInitID [sb [0-15]]

Requires a SaveConfiguration command

Get syntax: get SCSIInitID

SCSIPortBusSpeed

Controls the transfer rate at which the iPBridge will attempt to negotiate with its SCSI devices. Ultra 2 SCSI valid only if iPBridge has LVD-capable SCSI ports

Default: Ultra3

Set syntax: set SCSIPortBusSpeed [sb [fast | ultra | ultra2 | ultra3]

Requires a SaveConfiguration command

Get syntax: get SCSIPortBusSpeed [PortNum]

SCSIPortList

Returns a list of available SCSI ports and their current status. Valid status values are O.K. and Failed.

Immediate command: SCSIPortList

SCSIPortReset

Resets the specified SCSI bus.

Immediate command: SCSIPortReset [sb]

SCSIPortResetOnStartup

Specifies whether the SCSI port should be reset on power-up or not

Default: enabled

Set syntax: set SCSIPortResetOnStartup [sb [enabled | disabled]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortResetOnStartup [sb]

SCSIPortSelTimeout

Indicates the time, in milliseconds, that the bridge waits for a response from a SCSI device on the selected port after a selection request.

Get syntax: get SCSIPortSelTimeout [sb]

SCSIPortSyncTransfer

Specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port.

Default: enabled

Set syntax: set SCSIPortSyncTransfer [[sb [enabled | disabled]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortSyncTransfer [sb]

SCSIPortTermination

Configures/reports the SCSI internal termination of the SCSI port identified.

Default: enabled

Set syntax: set SCSIPortTermination [sb [enabled | disabled]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortTermination [sb]

SCSIPortWideTransfer

Specifies whether wide SCSI transfers should be negotiated.

Default: enabled

Set syntax: set SCSIPortWideTransfer [sb [enabled | disabled]]

Requires a SaveConfiguration command

Get syntax: get SCSIPortWideTransfer [sb]

SCSITargets

Returns a list of SCSI devices operational on the SCSI port.

Immediate command: SCSITargets 0

SpeedWrite

When enabled, improves the performance of FCP WRITE commands to SCSI devices attached to the iPBridge.

Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device

Set syntax: set SpeedWrite SCSI [sb st sl | all] [enabled | disabled]

Get syntax: get SpeedWrite SCSI [sb st sl | all]

SpeedWriteDefault

When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the iPBridge will not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.

Default: disabled

Set syntax: set SpeedWriteDefault [enabled | disabled]

Get syntax: get SpeedWriteDefault

2.2.6 Serial port configuration commands

The ATTO iPBridge serial ports or serial headers are configured with default settings but may be customized to your specifications using the CLI commands in this section.

SerialPortBaudRate

Configures/reports the baud rate for the iPBridge RS-232 serial port or serial header. The number of data bits per character is fixed at 8 with no parity. Choices are 2400, 9600, 19200, 38400, 57600 and 115200.

Default: 115200

Set syntax: set SerialPortBaudRate [2400 | 9600 | 19200 | 38400 | 57600 | 115200]

Requires a SaveConfiguration command

Get syntax: get SerialPortBaudRate

SerialPortEcho

Enables/disables/reports the echoing of keyboard input. When enabled, all non-control character keyboard input is output to the display. Local ASCII terminal (or terminal emulator) echo settings should be set to disabled while using SerialPortEcho enabled

Default: enabled

Set syntax: set SerialPortEcho [enabled | disabled]

Requires a SaveConfiguration Restart command

Get syntax: get SerialPortEcho

2.2.7 Ethernet commands

These commands configure the management and data Ethernet ports including Telnet parameters.

DPMTU

Controls the MTU (Maximum Transmission Unit) used by the data port: increasing the MTU may improve throughput on the ipBridge data ports. The MTU for the management port cannot be changed.

Default: 1514

Set syntax: set DPMTU dp0 [1514 | 9014]

Requires a SaveConfiguration command

Get syntax: get dp0 DPMTU

EthernetSpeed

Specifies the speed of the Ethernet ports. If auto is enabled, the speed will be negotiated. 10 and 100 speeds are half duplex Ethernet speed settings in the host must be the same as Ethernet speed settings in the ipBridge. The ipBridge default Ethernet speed is auto: your host must be set to auto. If you set Ethernet speed to 10, your host must be set to Ethernet speed 10, half duplex. If you set Ethernet speed to 100, your host must be set to Ethernet speed 100, half duplex.

Choices are

10 = 10 baseT

100 = 100 baseT

1000 = 1000baseT

Default: auto

Set syntax: set EthernetSpeed dp0 [10 | 100 | 1000 | Auto]

Requires a SaveConfiguration command

Get syntax: get EthernetSpeed dp0

Exit

Exits the current Telnet CLI session; it has no effect if used during a serial CLI session.

Immediate command: Exit

IPAddress

Controls the IP address of the ipBridge Ethernet data ports. If IPDHCP is enabled, the get command reports the current IP address assigned by the network DHCP server, followed by the DHCP identifier.

Default IP address: 10.0.0.1

Set syntax: set IPAddress dp0 xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get IPAddress dp0

IPDHCP

Selecting DHCP allows the ipBridge to request an IP address from the network DHCP server. The network must have at least one DHCP server

Default: enabled

Set syntax: set IPDHCP dp0 [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get IPDHCP dp0

IPGateway

Controls the current gateway. If IPDHCP is enabled (see above), get command reports the current IP gateway assigned by the network DHCP server

Default: 0.0.0.0

Set syntax: set IPGateway dp0 xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get dp0 IPGateway

IPSubnetMask

Controls the current subnet mask. If IPDHCP is enabled (see above), get command reports the current subnet mask assigned by the DHCP server

Default: 255.255.0.0

Set syntax: set IPSubnetMask dp0 xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

Get syntax: get dp0 IPSubnetMask

Password

Specifies a password for all sessions: Telnet, FTP and ExpressNAV web-based interface. You will be prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command RestoreConfiguration default sets the password to its default value.

Default: Password

Set syntax: set Password

Requires a SaveConfiguration command

Ping

Ping will send an ICMP echo request to the specified host.

Immediate command: ping dp0 [xxx.xxx.xxx.xxx] <count <size>>

ReadOnlyPassword

Specifies a read only password for all sessions: Telnet, FTP and ExpressNAV web-based interface. You will be prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command RestoreConfiguration default sets the password to its default value.

Default: Password

Set syntax: set ReadOnlyPassword [password]

Requires a SaveConfiguration command

RMON

RMON collects and stores Ethernet data on data ports at specified intervals. You can display the entire table requested, or a single entry based on the index (and sample index for the Ethernet History table).

Entries in the Ethernet History table are not valid when their Sample Index is 0.

Setting the history control entries take effect immediately, but changes must be saved to be persistent over a reboot.

Valid range for EthernetStat index: 1-3

Valid range for historyControl and EthernetHistory index: 1-6

Valid range for historyControl buckets requested: 1-180

Valid range for historyControl interval: 1-3600

Default historyControl table (buckets and interval in hexadecimal): Refer to Exhibit 2.2.7-1 below.

Set syntax: set RMON idx bucketsRequest interval [valid | invalid]

Get syntax for entire table: get RMON [ethernetStat | historyControl] <idx>

Get syntax for single index entry: get RMON ethernetHistory <idx sampleIdx>

Username

Specifies a username for all Telnet, FTP and ExpressNAV web server sessions. Username is case insensitive, 1-32 characters with no spaces. You must have an Admin password to change Username.

Default: root

Set syntax: set Username [username]

Requires entering a password

Requires a SaveConfiguration command

Get syntax: get Username

ReadOnlyUsername

Specifies a read only username for all Telnet, FTP and ExpressNAV web server sessions. Username is case insensitive, 1-32 characters with no spaces.

Default: user

Set syntax: set ReadOnlyUsername [username]

Requires a SaveConfiguration command

Get syntax: get Username

Exhibit 2.2.7-1 Default historyControl table (buckets and interval in hexadecimal) for the RMON CLI command.

Idx	DataSrc	BktReq	BktGrant	Interval	Owner	Status
001	43.6.1.2.1.2.2.1.1.1	00000032	00000032	0000001e	monitor	00000004
002	43.6.1.2.1.2.2.1.1.1	00000032	00000032	00000708	monitor	00000004
003	43.6.1.2.1.2.2.1.1.2	00000032	00000032	0000001e	monitor	00000004
004	43.6.1.2.1.2.2.1.1.2	00000032	00000032	00000708	monitor	00000004
005	43.6.1.2.1.2.2.1.1.3	00000032	00000032	0000001e	monitor	00000004
006	43.6.1.2.1.2.2.1.1.3	00000032	00000032	00000708	monitor	00000004

2.2.8 iSCSI commands

You may customize the iPBridge to your specifications using the CLI commands in this section.

iSCSIAlias

Provides a human-readable name assigned to the iPBridge. Aliases may be 1 to 64 characters long and may contain spaces if spaces are enclosed in quotation marks. Entering the set iSCSIAlias command with no alias parameter causes the alias to be removed.

Default: ""

Set syntax: set iSCSIAlias [Alias]

Requires a SaveConfiguration command

Get syntax: get iSCSIAlias

iSCSIChap

Enables/disables requiring CHAP (Challenge-Handshake Authentication Protocol) to be used for the iSCSI protocol. If MultiTargetMode has been enabled, a valid target name must be provided. If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets. An initiator may reject this negotiation.

Default: disabled

In single target mode, set syntax: set iSCSIChap [enabled | disabled]

In single target mode, get syntax: get iSCSIChap

In multiple target mode, set syntax: set iSCSIChap [Target Name] [enabled | disabled]

In multiple target mode, get syntax: get iSCSIChap [Target Name]

iSCSIChapSecret

Specifies the incoming and outgoing passwords for iSCSI chap sessions. RestoreConfiguration default sets the CHAP secret passwords pair to default values.

Secrets are case sensitive, 12 (16 for Microsoft iSCSI initiator) to 32 characters, and cannot contain spaces. In and out secrets must be different.

When either secret is all 0's, iSCSI CHAP authentication is disabled. Additionally, an all '0' secret can be configured by entering the iSCSIChapSecret command confirmation prompts with no parameters.

An in CHAP secret is for authentication of the server to the iPBridge. The iPBridge can store up to 32 in secrets, each with a unique Account Name (optionally the

Initiator Name) and secret pair. The Account Name can be 1 to 223 characters. Account Names are case sensitive. Account name can not be all.

An out chap secret is for authentication of the iPBridge to the rest of the network. There can only be one out secret. The account name is ignored for out secrets and defaulted to root.

In single target mode, set syntax: set iSCSIChapSecret [in | out | delete] [Account Name] <Secret>

In single target mode, get syntax: get iSCSIChapSecret [Account Name | all]

In multiple target mode, set syntax: set iSCSIChapSecret [Target Name] [in | out | delete] [Account Name] <Secret>

In multiple target mode, get syntax: get iSCSIChapSecret [Target Name] [Account Name | all]

iSCSIPortNumber

Specifies the port number whereby the iPBridge will listen for iSCSI connections. The port number must be between 1024 and 65535 except for port 860.

Default: 3260

Set syntax: set iSCSIPortNumber portnum

Requires a SaveConfiguration command

Get syntax: get iSCSIPortNumber

iSCSITarget

Creates/deletes an iSCSI target name. The target name will act as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. MultiTargetMode must be enabled to use this command. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command: iSCSI [Target Name] <delete>

iSNSLoginControl

Specifies whether the iPBridge will delegate its access control/authorization to an iSNS server.

Default: disabled

Set syntax: set iSNSLoginControl [enabled | disabled]

Requires a SaveConfiguration command

Get syntax: get iSNSLoginControl

iSNSServer

Specifies whether the IP address of a valid iSNS server from which the iPBridge will attempt iSCSI initiator discovery. Setting to 0.0.0.0 will disable iSNS server lookup.

Default: 0.0.0.0

Set syntax: set iSNSServer [xxx.xxx.xxx.xxx]

Requires a SaveConfiguration command

Get syntax: get iSNSServer

MultiTargetMode

Enables/disables iSCSI multiple target mode addressing on the iPBridge. If enabled, all previous maps will be deleted. In verbose mode, overwriting a map requires secondary confirmation of the action.

Set syntax: set MultiTargetMode [enabled | disabled]

Get syntax: get MultiTargetMode

2.2.9 Mapping commands

You may map devices via the web-based server or through the management or serial ports.

AutoMap

Automatically assigns a subset of iSCSI LUNs to a subset of SCSI target destination devices visible to the iPBridge. Valid existing maps will not be deleted.

Immediate command: AutoMap

iSCSITarget

Creates/deletes an iSCSI target name. The target name will act as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. MultiTargetMode must be enabled to use this command. In verbose mode, overwriting a map requires secondary confirmation of the action.

Immediate command: iSCSITarget [Target Name]
<delete>

MultiTargetMode

Enables/disables iSCSI multiple target mode addressing on the iPBridge. If enabled, all previous maps will be deleted. In verbose mode, overwriting a map requires secondary confirmation of the action.

Default: disabled

Set syntax: set MultiTargetMode [enabled | disabled]

Get syntax: get MultiTargetMode

Route

Assigns a host protocol address to a target destination device. If MultiTargetMode has been enabled, a valid target name must be specified. If you try to map a new SCSI BTL to the same iSCSI LUN, the new BTL overwrites the previous map. Using the Delete identifier removes the map from its map table. In verbose mode,

overwriting a map requires secondary confirmation of the action.

Immediate command in single target mode:

Route iSCSI [lun] [SCSI [bb tt ll] | Delete]

Immediate command in multiple target mode:

Route iSCSI [Target Name] [lun] [SCSI [bb tt ll] | Delete]

RouteDisplay

Displays a list of iSCSI to SCSI Bus, Target, LUN mappings. If MultiTargetMode has been enabled, the optional Target Name parameter limits the list to the maps which satisfy a search for the given target name. In either mode, the optional LUN parameter will limit the list to the map which satisfies a search for the given LUN.

NumEntries: decimal number of map lines displayed

Target Name: target name

Lun : target LUN

sb: decimal SCSI bus number

st: decimal SCSI target number

sl: decimal SCSI LUN number

Immediate command, single target mode:

RouteDisplay iSCSI <lun>

Immediate command, multiple target mode:

RouteDisplay iSCSI <Target Name> <lun>

SCSIInitID

Specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIInitID must be set to offline and will become invalid upon issuing this command. Choices are 0 to 15.

Default: 7

Set syntax: set SCSIInitID [sb [0-15]]

Requires a SaveConfiguration command

Get syntax: get SCSIInitID

SCSITargets

Returns a list of SCSI devices operational on the SCSI port.

Immediate command: SCSITargets 0

2.2.10 Privileged OEM configuration services

Privileged OEM configuration services perform OEM-specific product branding and labeling functions only available to OEM customers such as vendor, product, and model number identification during power up display.

Privileged OEM Configuration commands may only be “set” from within an OEM config file.

The OEM config file is an ASCII text file which contains all the CLI commands that can be used to override the factory default settings of the iPBridge. It consists of a header record and a list of CLI commands. Each line may contain up to 128 characters and must be terminated by any of the standard EOL combinations such as \r, \n, or \r\n. Updates may be loaded via any of the current firmware update methods (see [Updating firmware](#) on page 47).

The commands do not result in reservation of the iPBridge. The information in a “get” command may only be displayed within a TTY CLI session. These commands will not be displayed in the help menu.

To configure iPBridge product identifiers

- 1 Create an OEM configuration file containing valid and applicable CLI commands.
- 2 Upload the OEM configuration file to the iPBridge via any of the currently available methods (see [Updating firmware](#) on page 47)
- 3 Initiate the OEM configuration file by typing RestoreConfiguration default and pressing **enter** at the CLI prompt, or by applying an NVRAM default jumper to the circuit board.
- 4 Power cycle.



Note

To restore factory default settings, type RestoreConfiguration ATTO, press **Enter** at the CLI prompt, and cycle power.

AutoMapOnBoot

Enables or disables an automatic bus scan and device mapping operation at boot time.

Default: enabled

Set syntax: set AutoMapOnBoot [enabled | disabled]

Get syntax: get AutoMapOnBoot

ColdReset

When enabled, the iPBridge will reboot when a Cold Reset command is received. When disabled, the iPBridge will not reboot, but will respond to the host with status unsupported.

Default: enabled

Set syntax: set ColdReset [enabled | disabled]

Get syntax: ColdReset

InquiryProductID

Controls the product ID string displayed by the iPBridge in response to a SCSI INQUIRY command. The ID is padded with 0s to a maximum 16 characters

Default: iPBridge 1500 or iPBridge 1550

Set syntax: set InquiryProductID [string]

Requires a SaveConfiguration command

Get syntax: get InquiryProductID

InquiryVendorID

Controls the vendor ID string displayed by the iPBridge in response to a SCSI INQUIRY command. The ID is padded with 0s to a maximum 8 characters

Default: ATTO

Set syntax: set InquiryVendorID [string]

Requires a SaveConfiguration command

Get syntax: get InquiryVendorID

IqnVendorPrefixID

Displays the vendor prefix ID of the iSCSI qualified name (iqn). The vendor prefix includes iqn ID string, date code, and naming authority.

Set syntax: set IqnVendorPrefixID [string]

Get syntax: get IqnVendorPrefixID

ModelNumber

Controls the iPBridge model number string to an OEM-specific value. Displays during POST and by using the Info CLI command. ID is padded with 0s to a maximum of 8 characters

Default: 1500 or 1550

Set syntax: set ModelNumber [string]

Requires a SaveConfiguration command

Get syntax: get ModelNumber

OEMConfigFile

Reports the name of the OEM Configuration file stored in persistent memory. If no file is present, ATTO is returned. The file is an ASCII text file which contains all the CLI commands that can be used to override the factory default settings of the iPBridge. It consists of a header record and a list of CLI commands. Each line may contain up to 128 characters and must be terminated by any of the standard EOL combinations such as \r, \n, or \r\n. Updates may be loaded via any of the current firmware update methods (see [Updating firmware](#) on page 47).

Default: ATTO

Get syntax: get OEMConfigFile

ProductID

Controls the iPBridge product ID string to an OEM-specific value. Displays during POST and the CLI Info command. ID is padded with 0s to a maximum of 16 characters

Default: iPBridge

Set syntax: set ProductID [string]

Requires a SaveConfiguration command

Get syntax: get ProductID

VendorID

Controls the iPBridge vendor ID string to an OEM-specific value. Displays during POST and the CLI Info command. is padded with 0s to a maximum of 8 characters

Default: ATTO

Set syntax: set VendorID

Requires a SaveConfiguration command

Get syntax: get VendorID

The following table lists the CLI commands supported in the OEM configuration (*.cfg) file. Any command which displays information is not honored in the *.cfg file, i.e., only the set version of commands will be honored.

OEM Config file supported commands

AutoMapOnBoot	iSCSIChap	Route
BridgeName	iSCSIChapSecret	SCSIInitID
ColdReset	iSCSIPortNumber	SCSIPortBusSpeed
DPMTU	iSCSITarget	SCSIPortResetOnStartup
EthernetControl	ISNSServer	SCSIPortSyncTransfer
EthernetSpeed	iSNSLoginControl	SCSIPortWideTransfer
InquiryProductID	iqnVendorPrefixID	SCSITermination
InquiryVendorID	ModelNumber	SerialPortBaudRate
IPAddress	MultiTargetMode	SerialPortEcho
IPDHCP	Password	SpeedWrite
IPGateway	ProductID	SpeedWriteDefault
IPSubnetMask	ReadOnlyPassword	Username
iSCSIAlias	ReadOnlyUsername	VendorID
	RMON	

2.3 Mapping devices

SCSI devices are mapped using the designations for the SCSI bus, target and LUN. The iPBridge automatically maps all devices during startup. If you wish to change mapping you may use the CLI or the browser-based interface, ATTO ExpressNAV.



Note

To map devices, you should have a host computer connected to the iPBridge Ethernet port. Refer to [Configuring the iPBridge](#) on page 13.

By default, a host or initiator will view the iPBridge as a single iSCSI node with all available SCSI devices shown as LUNs on a single iSCSI target.

You may use multiple target mode to break the single iSCSI node into multiple nodes. Multiple target mode allows you to grant or deny access between initiators and devices as needed.

Node names

iSCSI nodes are accessed through the Ethernet ports on an iPBridge, each identified by its own IP address.

The iPBridge uses the iqn name format, referencing the device serial number, to guarantee that the target name is world-wide unique:

```
iqn.1995-12.com.attotech:ipbridge:
serialnumber
```



CAUTION

Changing the device map can affect the host's view of devices and your application configuration.

Single target mode

Single target mode is the default. Use the CLI commands or the ExpressNAV interface to map devices automatically or manually.



Note

The iPBridge automatically maps all devices on startup.

Use Command Line Interface

To map devices automatically with CLI

- 1 At the command prompt, type

AutoMap

All the CLI commands necessary to enable mapping and the command saveconfiguration norestart will be performed.

To map devices manually with CLI

- 1 Type SCsITargets 0 to list the SCSI devices connected to the SCSI port.

The SCsITargets command lists each device and its corresponding SCSI address. In the example in Exhibit 2.3-2, the first tape drive is on SCSI Port 0 (on the iPBridge) at Target ID 4, LUN 0.

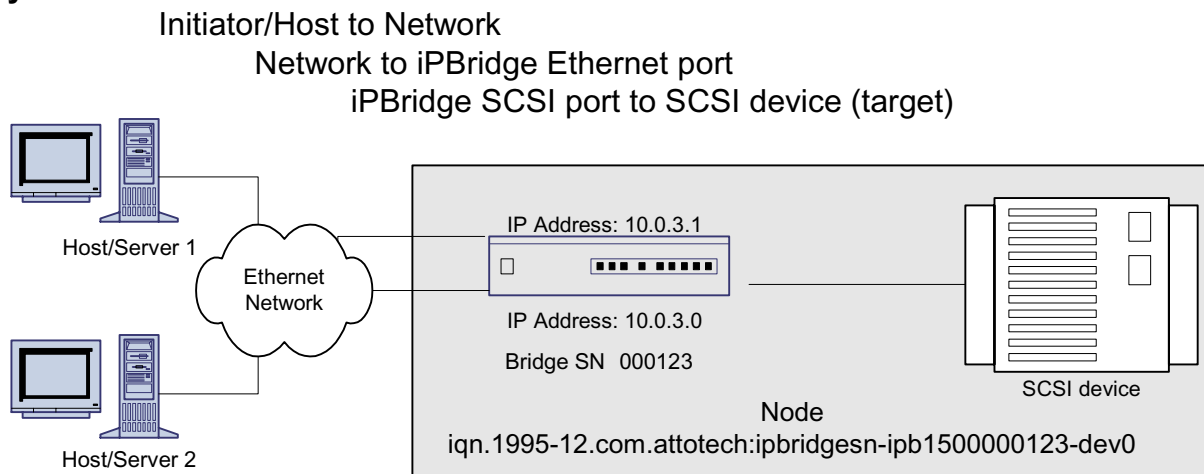
- 2 The Route command manually maps SCSI devices through the bus/target/LUN.
 - The command assigns an iSCSI LUN protocol address to a target destination device.
 - More than one iSCSI LUN may not be assigned to a SCSI BTL. If you try to map a new SCSI BTL to the same iSCSI LUN, the new BTL will overwrite the original map.

Type

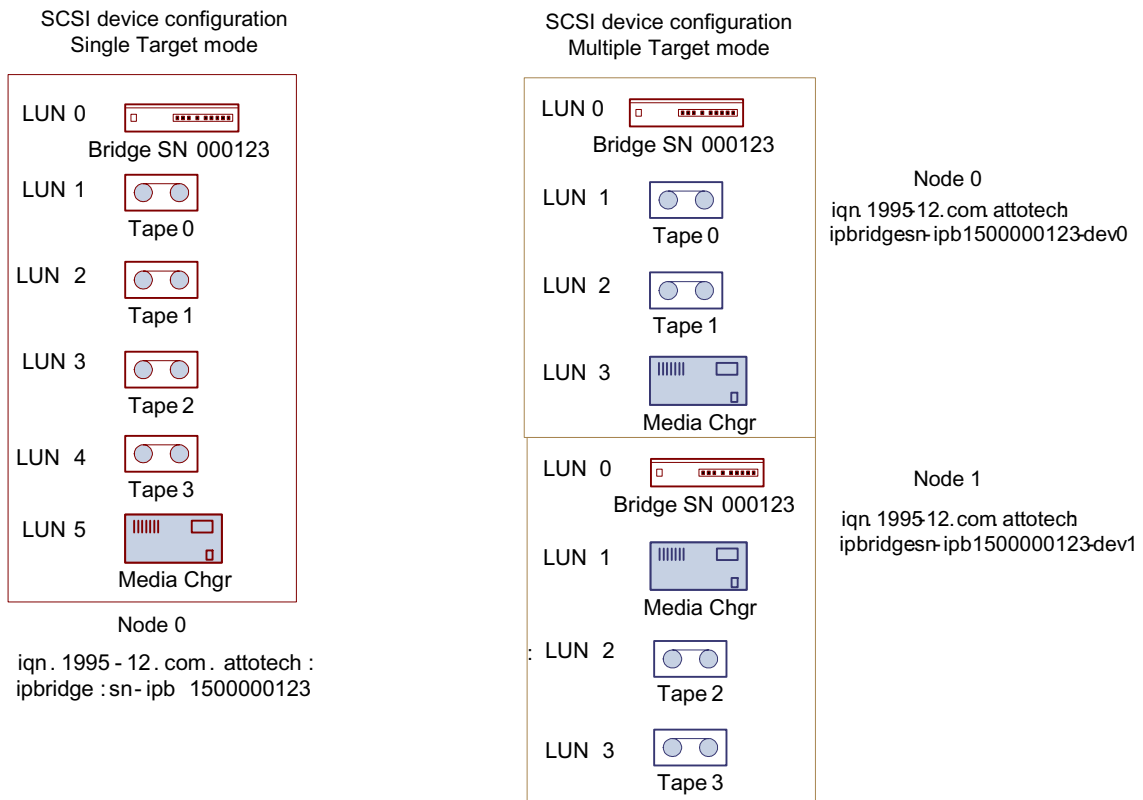
```
Route iSCSI <LUN> SCSI <sb> <st> <sl>
```

- st and sl are the SCSI target ID and SCSI LUN that the SCSI device is currently configured for.
- 3 Type RouteDisplay iSCSI to display the current mapping and the current status of the device for iSCSI configurations.
RouteDisplay may be used at any time.

Physical connections



Mapping: single vs. multiple target mode



To remove mapping

Type

```
Route iSCSI [lun] Delete
```

Use the ExpressNAV interface

The ATTO Technology ExpressNAV, a browser-based configuration tool, allows you to map devices to the SCSI ports using a web-based GUI. See [ExpressNAV provides web-based interface](#) on page 19.

To map devices automatically with ExpressNAV

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.

- 2 Click **AutoMap**

All the CLI commands necessary to enable mapping and the command saveconfiguration norestart will be performed.

To map devices manually with ExpressNAV

- 1 From the ExpressNAV main menu, click on the **Mapping** menu item on the left side of the screen.
- 2 Select the devices from the box on the right hand side of the screen and drag to the appropriate LUN on the left.
- 3 Click **Submit**.

All the CLI commands necessary to enable mapping and the command saveconfiguration norestart will be performed.

Multiple target mode

Multiple Target Mode breaks the single iSCSI node of the iPBridge and replaces it with a much more configurable mapping scheme. This new mapping scheme allows you to segregate storage into different iSCSI nodes within the iPBridge, with each iSCSI target having its own set of access criteria.

For example, if you have two servers and a library with four tapes and a media changer, the default mapping would provide both servers access to all tapes and the media changer (single target mode).

If you configured multiple target mode, you would be able to map some devices to one server and other devices to the other server, requiring separate usernames and passwords for access.



CAUTION

If actual storage is mapped to more than one iSCSI target and a server has authorization for both targets, the server could show duplicate storage without any warning to the user.

If multiple target mode is enabled, the Automap, Route, RouteDisplay and CHAP CLI commands behave differently. (Refer to [Ethernet commands](#) on page 35.)

After enabling MultiTargetMode through the CLI command set multitargetmode, you may map devices using the CLI commands Automap or

Route or by using the ExpressNAV interface. You may also cycle power and the iPBridge will automatically map all devices to separate nodes.

To control access, different CHAP account names and CHAP secrets can be assigned to each target. (Refer to [iSCSI commands](#) on page 37)

Use Command Line Interface

To map devices automatically with CLI

- 1 At the CLI prompt type

```
set MultiTargetMode enabled
```

Because current mapping will be deleted, you are asked for confirmation to change mapping.

- 2 At the command prompt, type

```
AutoMap
```

- All the CLI commands necessary to enable mapping and the command saveconfiguration norestart will be performed.
- The iPBridge will map itself as a device at LUN 0.
- Each SCSI device will be placed at LUN 1 and a target name suffix will be added to the iqn

```
bxtyy-vendorid-devicename
```

- x is the iPBridge SCSI port number
- yy is the SCSI device SCSI target ID
- vendorid is the SCSI device vendor ID
- devicename is the SCSI device's inquiry device name.

To manually configure MultiTargetMode

1 At the CLI prompt type

```
set MultiTargetMode enabled
```

Because current mapping will be deleted, you are asked for confirmation to change mapping.

2 Type SCSITargets to list the SCSI devices connected to the SCSI port.

The SCSITargets command lists each device and its corresponding SCSI address. In the example in Exhibit 2.3-2, the first tape drive is on SCSI Port 0 (on the IPBridge) at Target ID 4, LUN 0.

3 The command iSCSITarget creates each iSCSI Target node. Type

```
iSCSITarget [name]
```

The name is a suffix appended to the standard IPBridge iqn name. The suffix name can be up to 24 characters.

4 Type RouteDisplay to see the results of the iSCSITarget command.

5 The Route command performs the mapping. Type

```
Route iSCSI <Target Name> <lun> SCSI <sb> <st> <sl>
```

- Target Name corresponds to the Target Name created with the iSCSITarget command.
- lun is the iSCSI LUN the SCSI device is to be mapped to
- sb is the SCSI bus/port on the IPBridge the device is connected to
- st and sl are the SCSI target ID and SCSI LUN that the SCSI device is currently configured for.

To map the first tape device listed in the scsitargets command in Exhibit 2.3-3, type

```
route iscsi tape0 scsi 0 4 0
```

To remove mapping

1 Type:

```
Route iSCSI [Target Name] [lun] delete
```

To remove an iSCSITarget

1 Type

```
iSCSITarget [Target Name] delete
```

Example

Refer to Exhibit 2.3-1. A SCSI library containing a media changer and four tapes is connected to the IPBridge through SCSI port 0.

In single target mode, the media changer is at 0, 0, 1 (port, target and LUN) and each of the tapes is at a different LUN.

The IPBridge occupies iSCSI LUN 0 by default. In multiple target mode, the media changer is mapped differently in each node: at iSCSI LUN 3 in node 0 and at iSCSI LUN 1 in node 1.

Exhibit 2.3-2 Result of typing SCSITargets 0

;	sb	st	sl	Device	Type	Vendor ID	Product ID	Rev.	Serial Number
	0	0	0	MediumChanger		ATTO	DVT	3.22	U0192529
	0	4	0	Tape			IBM ULTRIUM-TD	38D0	1110094262 U
	0	5	0	Tape			IBM ULTRIUM-TD	38D0	1110122312 U
	0	6	0	Tape			IBM ULTRIUM-TD	38D0	1110122344 U

Exhibit 2.3-3 Result of typing RouteDisplay iSCSI

;	Target Name	Lun	SB	ST	SL
;	=====				
	tape0	0	Bridge		
	tape0	1	0	4	0

2.4 Updating firmware

Several processors control the flow of data in the ATTO iPBridge. The firmware to control these processors can easily be upgraded in the field using the PUT command from an FTP connection.

The iPBridge firmware is distributed as a compressed .zip file and can be obtained from the ATTO Technology, Inc. web site at www.attotech.com.

To use FTP over GbE to flash new firmware into the iPBridge

- 1 Uncompress the .zip file obtained from the ATTO Technology Inc. website

(www.attotech.com) into an image file (.ima). Note the filename.

- 2 Establish an FTP link to the bridge that is to be flashed.
- 3 Use the PUT command to download the firmware. For example

```
c:\bridge_firmware\I1500110.ima
```

- 4 Once the download is complete, cycle power on the iPBridge to activate the new firmware.

Appendix A Safety standards and compliances

The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. See the Technical Specification sheet for a full list of certifications.



WARNING

Risk of explosion if battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

No operator serviceable components inside the iPBridge 1500E/D or the 1550E/D.

Do not remove cover of iPBridge 1500D or the iPBridge 1550D. Refer servicing to qualified personnel.

FCC Standards: Radio and Television Interference



WARNING

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.
- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

Canadian Standards



This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



European Standards

Declaration of Conformity

This following statement applies to the ATTO iPBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN50082-1

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.

Appendix B ATTO accessories

The following accessories are available through ATTO Technology. Contact an ATTO Technology authorized sales representative to order.

iSCSI Bridge board-level models

ATTO iPBridge 2500C

IPBR-2500-C00 3 Gigabit Ethernet by 2 LVD SCSI

ATTO iPBridge 1500E

IPBR-1500-E00 1 Gigabit Ethernet by 1 LVD SCSI

iSCSI Bridge desktop models & desktop models with rackmount kits

ATTO iPBridge 2500R/D

IPBR-2500-D00 3 Gigabit Ethernet by 2 LVD SCSI

ATTO iPBridge 1500D

IPBR-1500-D00 1 Gigabit Ethernet by 1 LVD SCSI 1,195

NDMP Bridge models

ATTO iPBridge 2500

IPBR-2500-CN0 3 Gigabit Ethernet by 2 LVD SCSI (board)

IPBR-2500-DN0 3 Gigabit Ethernet by 2 LVD SCSI (desktop)

ATTO FC Rack System (build to order)

FC Rack Enclosures with Power Supplies

FCRS-BAS1-000 Rack System with Single Power Supply

FCRS-BAS2-000 Rack System with Redundant Power Supplies

FibreBridge 3300

FCBR-3300-RL0 2-Gigabit FibreBridge to LVD Ultra SCSI Bridge

Field Replacement Units (FRU)

PWRA-0000-FRUPower Module for ATTO FC Rack System

FCBR-3300-RLF ATTO FibreBridge 3300R LVD Replacement Unit

SCSI cables & accessories

Cables/SCSI

CBL-VHDC-003	Cable, SCSI External, VHDCI to VHDCI, 3m.125
CBL-V68E- 03X	Cable, SCSI, External, VHDCI to HD68, U320-rated, 1m 95
CBL-FP68-C3	68-pin "P" / 50-pin Centronics – 1m
CBL-FP68-C6	68-pin "P" / 50-pin Centronics – 2m
CBL-FP68-C25	68-pin "P" / 50-pin Centronics – 8m
CBL-FP68-C79	68-pin "P" / 50-pin Centronics – 24m
CBL-F68E-00X	68-pin "P" / 68-pin fine pitch "P" – 1ft
CBL-U68E-681	68-pin "P" / 68-pin fine pitch "P" – 1m
CBL-F68E-686	68-pin "P" / 68-pin fine pitch "P" – 2m
CBL-F68E-003	68-pin "P" / 68-pin fine pitch "P" – 3m
CBL-F68E-010	68-pin "P" / 68-pin fine pitch "P" – 10m
CBL-F68E-025	68-pin "P" / 68-pin fine pitch "P" – 25m
CBL-F68E-68X	68-pin "P" / 68-pin fine pitch "P" – 16m.
CBL-V68E-4868-pin offset VHDCI to 68-pin VHDCI	

Accessories

TERM-V68E-002	Terminator, LVD SCSI, VHDCI, Active 125
ADAP- 50AF- 68P*	Adapter, SCSI, 50pin "A" Female to 68pin "P" Female 60

Appendix C Contact ATTO Technology, Inc.

Customer service, sales Get syntax and technical support are available by phone Monday through Friday, Eastern Standard Time 8:00 a.m. to 8:00 p.m., or by fax and web site 24-hours a day.

ATTO Technology, Inc.
155 CrossPoint Parkway
Amherst, New York 14068
(716) 691-1999 • voice
(716) 691-9353 • fax
<http://www.attotech.com>

ATTO Technology can also be reached via e-mail at the following addresses:

Sales Support: sls@attotech.com

Technical Support: techsupp@attotech.com